

BARRIER SHEET AND METHOD OF MAKING SAME

Abstract

Material with high oxygen barrier properties is prepared by evaporating polyfunctional acrylate monomer and condensing the acrylate as a monomer film on a plastic sheet, or by roll coating acrylate monomer onto a sheet in a vacuum. The acrylate is polymerized by irradiation by ultraviolet or electron beam. A layer of metal or oxide oxygen barrier material is applied over the first layer of cross-linked acrylate. A polymerized acrylate layer is applied over the metal layer. Low oxygen permeability polypropylene, polyester or nylon sheets can be made by these methods. Adhesion of the acrylate layer on the plastic sheet substrate is enhanced by reactive plasma treatment of a surface immediately before deposition, the plasma treatment and coating being conducted in vacuum within less than three seconds between plasma treatment and coating. Condensation efficiency is also enhanced by chilling the substrate of the substrate on which the acrylate is condensed to temperatures below 0°C. A backup drum in the apparatus may be cooled to less than -15°C.